

US EPA ARCHIVE DOCUMENT

Incidence of *Batrachochytrium dendrobatidis* (*Bd*) in Rhode Island Anuran Populations



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Introduction

- estimated one third of all amphibian species are declining globally (Stuart et al. 2004; Pounds 2006; Carey 2000)



Batrachochytrium dendrobatidis (Bd)



http://cirs.ucr.edu/chytrid_fungus.html

Geographic Distribution of *Bd*



Orange points represent *B. dendrobatidis* localities known from published accounts; white points represent unpublished known localities where the pathogen has been successfully cultured. This map was produced by <http://www.spatial epidemiology.net/bd/>

Climate Change & Environmental Factors

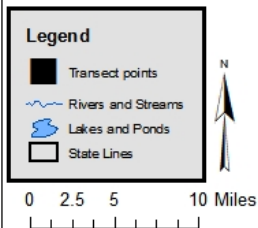
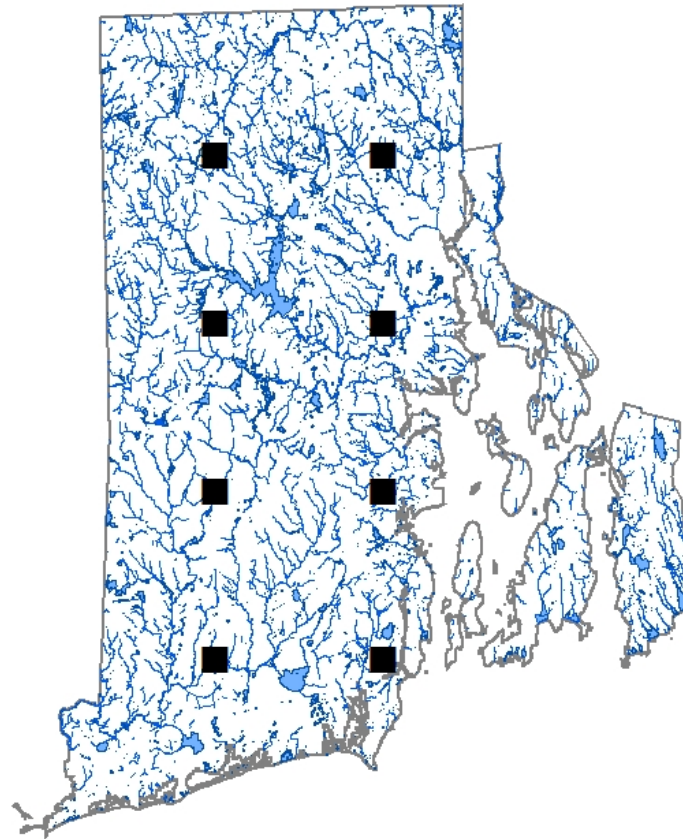
- Temperature (Pounds 2006; Laurence 2008)
- Altitude, humidity, and oxygen concentration
(Carey 2000; Daszak et al. 2003; Bosch et al. 2000)
- pH (Bosch et al. 2000)
- Population density (Parris and Beaudoin 2004)

Objectives

1. determine whether *Bd* is present in RI
1. establish geographical distribution of *Bd* in RI
2. investigate whether any correlations exist between land use patterns and the presence of *Bd* in Rhode Island.



Rhode Island Transect Points



This map was created to assist Mandy M. Gaudreau with her Masters of Science thesis "Incidence of *Batrachochytrium dendrobatidis* in Rhode Island Anuran Populations". Rhode Island GIS data was used to show the highly interconnected waterways of Rhode Island. Source: Rhode Island GIS data, all shapefiles pertaining to "transect points" were created by Mandy M. Gaudreau on 2/10/10. Map created by Mandy M. Gaudreau 2/10/10, Antioch University New England, Keene, NH.

Study Sites

Sample Site

Acadia Management Area
Frosty Hollow Pond

Meshanticut Lake

Lincoln Woods State Park

Spring Grove Pond

Sprague Farm Vernal Pools

S. Kingston Swamp & Vernal Pool

North Burial Grounds

Hope Valley Pond

Goddard State Park

North Scituate Vernal Pool



Experimental Design



Green Frog
(*Lithobates clamitans*)



Bullfrog
(*Lithobates catesbeianus*)



Pickerel Frog
(*Lithobates palustris*)



Wood Frog
(*Lithobates sylvatica*)



American Toad
(*Anaxyrus americanus*)

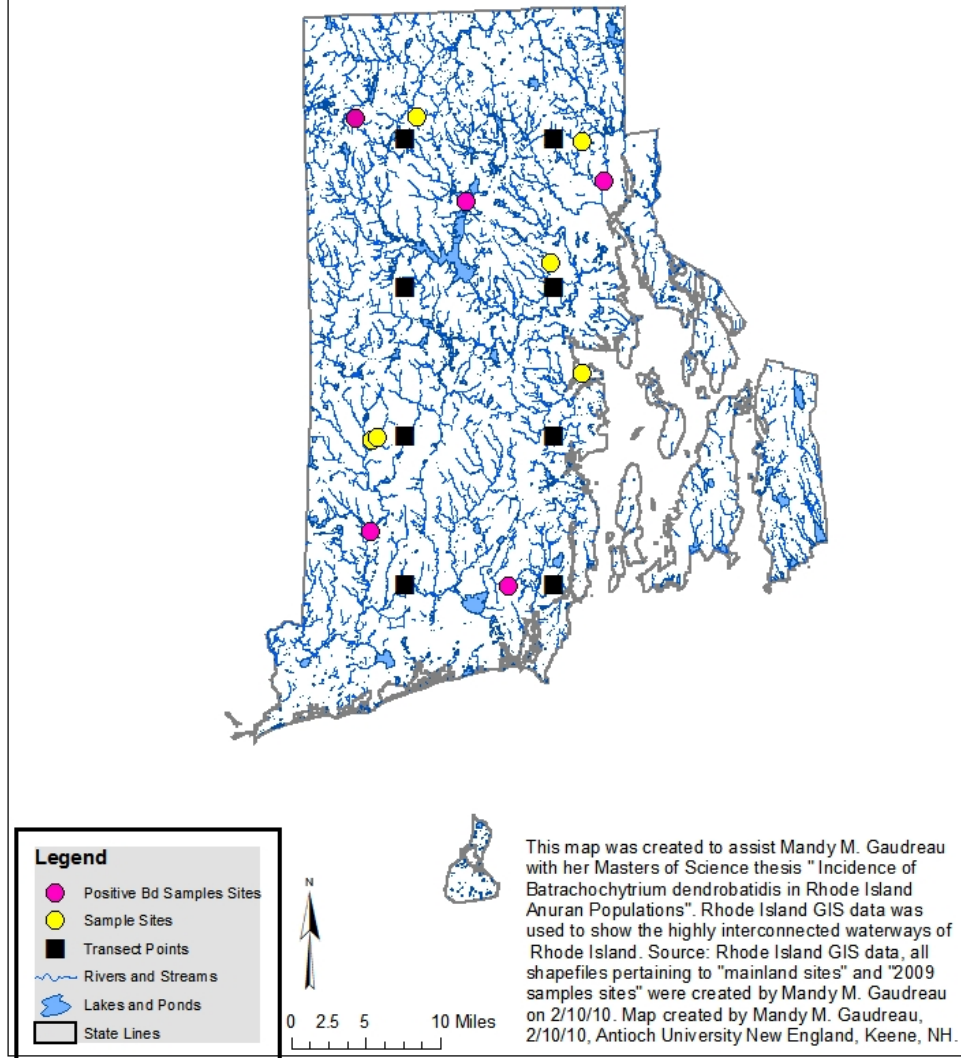


Tadpoles

Results

Sample site	Species	Bd infection intensity	Number of swabs
Meshanticut Lake	Bullfrogs	+++	2
N. Scituate Vernal Pool	Wood Frog	+++	1
Sprague Farm Vernal Pools	Bullfrogs	+++	3
	Green Frogs	+	8
South Kingston Swamp	Green Frogs	++	7
	Pickerel Frogs	++	2
Hope Valley	Green Frogs	+	8
	Green Frogs	++	8
	Green Frog Tadpoles	+++	8
	Green Frog Tadpoles	+++	8

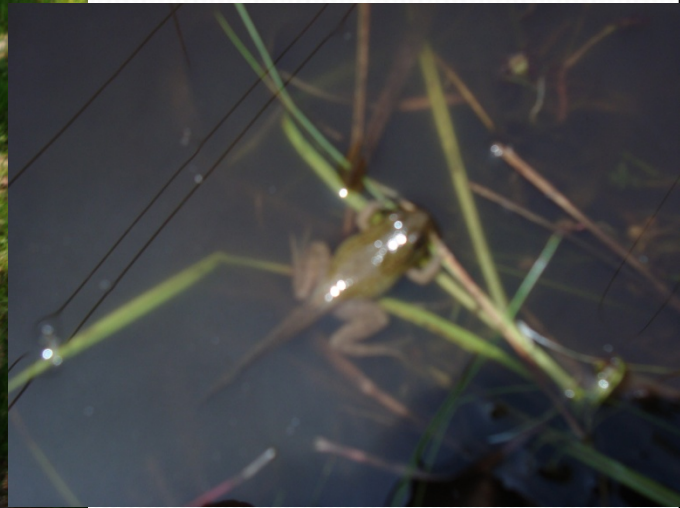
Rhode Island Sample Sites



Results

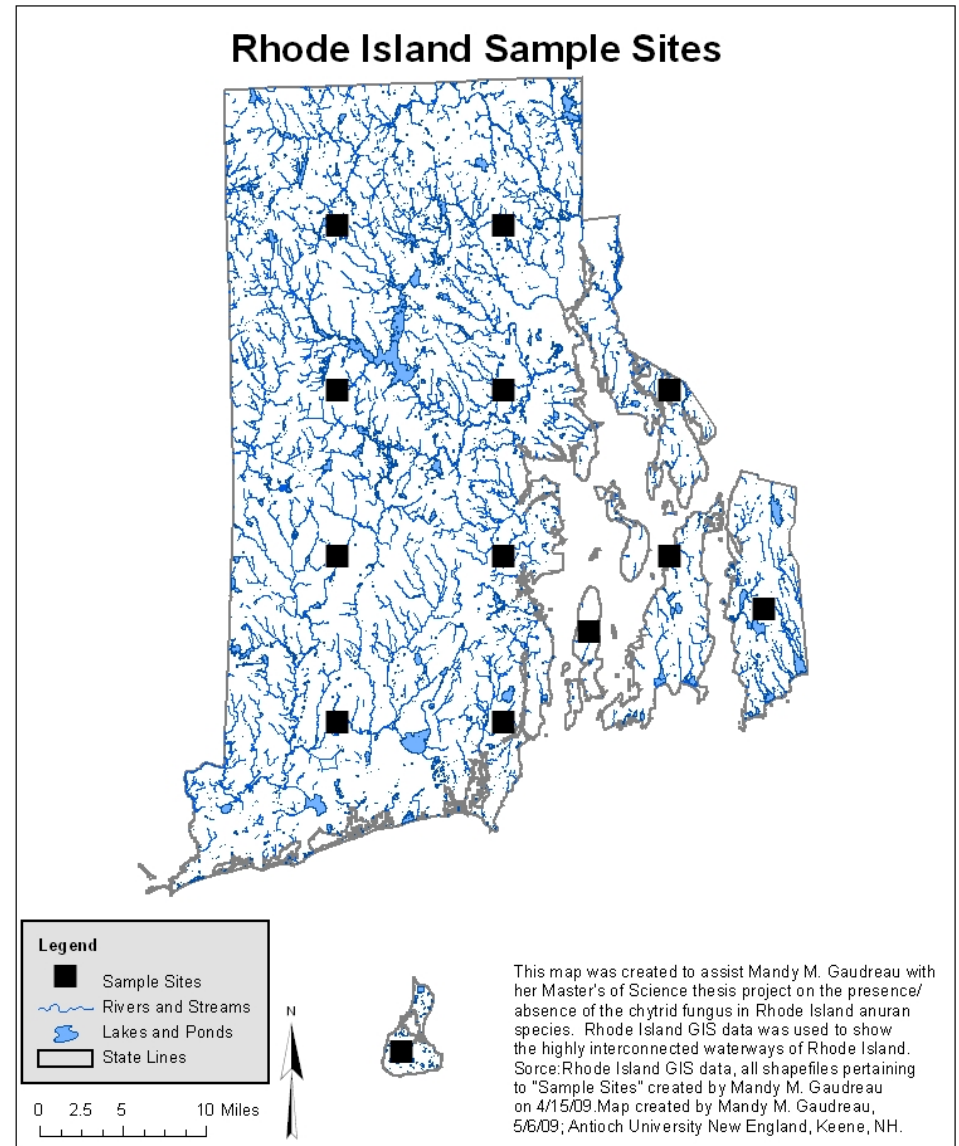
- land use patterns and environmental factors
- Adult anurans more likely to be infected than tadpoles
- Aquatic species more likely to be infected than terrestrial species

Conservation Implications



Future of Study

- May and June 2010
- Investigate if water bodies with anurans testing positive for *Bd* infections are linked hydrologically



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 - Alison Whitlock at USFWS
 - Dan Zeh at Antioch University New England

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